NEWS RELEASE
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Effectiveness of fuel treatments in the west depends on thinning intensity

Simulation study of more than 45,000 forest stands provides scientific basis for fuel reduction guidelines

WASHINGTON, Aug. 1, 2011–In the largest ever study of fuel treatment effectiveness, U.S. Forest Service researchers have found that intense thinning treatments that leave between 50 and 100 trees per acre are the most effective in reducing the probability of crown fires in the dry forests of the western United States.

The study, the results of which are published in a recent issue of the Canadian Journal of Forest Research, provides a scientific basis for establishing quantitative guidelines for reducing stand densities and surface fuels. The total number of optimal trees per acre on any given forest will depend on species, terrain and other factors.

"This study proves once again that an ounce of prevention equals a pound of cure," said U.S. Forest Service Chief Tom Tidwell. "Thinning dense forests reduces the impacts of the catastrophic wildfires we've already seen this year and expect to see more and more of in the future. This work helps protect communities, provides jobs and promotes overall better forest health."

Decades of excluding fire in the Western states have resulted in densely packed stands and a buildup of forest-floor fuels in many dry forests, which can lead to large, continuous crown fires when wildfires do occur. Crown fires are of particular concern to managers because they are challenging to suppress and are capable of causing widespread mortality in stands.

This year, Arizona and New Mexico have already experienced the worst fires in the states' histories. The importance of thinning was illustrated by the recent Wallow fire in Arizona, which burned more than 538,000 acres. Although 38 structures burned, a system of fuel treatments developed cooperatively by federal, state and local governments, as well as private citizens, successfully reduced fire behavior and allowed firefighters to protect thousands of structures and, in many places, halt the spread of the fire.

"Most forest managers understand that dry Western landscapes need to be heavily thinned to significantly reduce the threat of crown fires, and our findings now give a sense of just how much thinning is required," said Morris Johnson, the study's lead and a research fire ecologist based at the station's Pacific Wildland Fire Sciences Laboratory. "We found that thinning at this level reduced tree density, raised the canopy base height, and reduced canopy density."

To test how effective fuel treatments in the Western states are in reducing the probability and severity of crown fires, Johnson, along with University of Washington researcher Maureen Kennedy and station research biologist David L. Peterson, used the Fire and Fuels Extension of the Forest Vegetation Simulator to simulate the effects of four types of thinning and surface fuel treatments in dry forest types in 11 Western states. By inputting information on weather and fuel conditions into the simulator—which is the standard computer model used by most federal, state, and tribal agencies—they generated simulations in 45,162 forest stands that depicted crown fire hazard and potential fire behavior based on thinning densities leaving 300, 200, 100, and 50 trees per acre.

"This kind of simulation modeling allows us to evaluate multiple treatment types across a large number of forest stands and conditions in diverse geographic areas," Johnson said. "It would be almost impossible to conduct a study like this on the ground."

Their simulations suggested that the effectiveness of fuel treatments in the West depends on thinning intensity, with the most intense treatments they studied, which leave 50 to 100 trees per acre, being more effective in reducing the threat of crown fires than less-intense treatments. Thinning to this level, along with the removal of post-treatment debris known as "slash," made conditions unfavorable for crown fire initiation and reduced the probability of active crown fire.

Findings from the study, in addition to confirming the importance of thinning treatments, can help managers to evaluate the effectiveness of their fuel treatments.
To read the article online, visit http://www.treesearch.fs.fed.us/pubs/38390.

To learn more about the Pacific Wildland Fire Sciences Laboratory, visit http://www.fs.fed.us/pnw/pwfsl.

The PNW Research Station is headquartered in Portland, Ore. It has 11 laboratories and centers located in Alaska, Oregon, and Washington and about 425 employees.

The mission of the U.S. Forest Service is to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations. The agency manages 193 million acres of public land, provides assistance to state and private landowners, and maintains the largest forestry research organization in the world.

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